

Appl. No 10/587,850 Amdt. dated April, 13 2010

Reply to Office Action March, 19 2010

Claims

1 (Canceled)

2 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31,
said ~~polarization layers~~ P_i being cartesian polarizers, and the normal vectors of
said ~~polarization layers~~ P_i being ~~arranged in planes which are perpendicular~~
~~to a common ground plane, and all said optical axes being coplanar to a~~
~~common ground plane~~ coplanar.

3 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 2,
said ~~polarizing layer vector~~ V_1 of P_1 and said ~~polarizing layer vector~~ V_2 of P_2
being perpendicular to V_2 ~~each other~~.

4 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 3,
said polarizing layers P_2 and P_3 forming being part of a common polarization
polarizing beam splitting layer with a common layer vector.

5 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31, comprising
at least one composed prism with a right triangular prism composed of base
comprising two right sub-prisms T_1 and T_2 each with an isosceles triangular
base;
the lateral surface of sub-prism T_2 ~~in-between the two sub-prisms~~ facing T_1 carrying
a cartesian polarization layer P_1 ;
the lateral surface of sub-prism T_1 , which together with a lateral surface of sub-

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prism T2 forms a common lateral surface of said composed prism, carrying a cartesian polarization layer P2.

6 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31, comprising
a right prism with an isosceles triangular base;
the two lateral surfaces of equal size of said prism carrying mutually
complementary each a polarization[[s]] layer[[s]].

7 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31,
comprising an additional fourth ~~polarization~~ polarizing beam splitting layer P4
which together with said P2 and ~~with said~~ P3 constitutes an additional
complex polarizer system cross-polarizer according to claim ~~30~~ 31.

8 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 7,
~~polarization layers P1 and P4 having parallel polarizing layer vectors and being coplanar and having a common layer vector, and the polarization layers P2 and P3 having parallel polarizing layer vectors and being coplanar and having a common layer vector, and all four layers having an intersection line.~~

9 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) comprising
at least two polarizing layers P_i ($i=1,2,\dots$);
said P_i characterized by a normal vector N_i normal to P_i and a polarizing layer vector V_i coplanar to P_i ;
said P_i having beam splitting properties, which split an incident beam into a

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transmitting and a reflected beam;
said V_i and the reflected beam spanning the plane of polarization of the reflected beam;
said V_i and the transmitting beam spanning a plane perpendicular to the plane of polarization of the transmitting beam;
 P_1 and a further polarizer being arranged along a first optical path S_1 such that the plane E_1 is spanned by V_1 and the optical axis of S_1 in P_1 , and the plane E_2 is spanned by the polarizing layer vector of said further polarizer and the optical axis of S_1 in said further polarizer;
said two polarizing layers being mutual complementary, characterized by the plane E_1^* , derived from E_1 by optional means for folding, being perpendicular to E_2 ;
 P_1 and a further polarizer being arranged along a second optical path S_2 such that the plane E_3 is spanned by V_1 and the optical axis of S_2 in P_1 , and a plane E_4 is spanned by the polarizing layer vector of said further polarizer and the optical axis of S_2 in said further polarizer;
said two polarizing layers being mutual complementary, characterized by the plane E_3^* , derived from E_3 by optional means for folding, being perpendicular to E_4 ;
said two optical paths S_1 and S_2 intersecting in P_1 with equal cutting angles between N_1 and S_1 and between N_1 and S_2 ;
the architecture of the system coupling the transmission at P_1 to a reflection at the further polarizer along S_1 and the corresponding reflection at P_1 to a transmission at the further polarizer along S_2 .

10 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) comprising
at least three polarizing layers P_i ($i=1,2,3,\dots$);

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said P_i characterized by a normal vector N_i normal to P_i and a polarizing layer vector V_i coplanar to P_i ;
said P_i having beam splitting properties, which split an incident beam into a transmitting and a reflected beam;
said V_i and the reflected beam spanning the plane of polarization of the reflected beam;
said V_i and the transmitting beam spanning a plane perpendicular to the plane of polarization of the transmitting beam;
 P_1 and P_2 being arranged along a first optical path S_1 such that the plane E_1 is spanned by V_1 and the optical axis of S_1 in P_1 , and the plane E_2 is spanned by V_2 and the optical axis of S_1 in P_2 ;
said polarizing layers P_1 and P_2 being mutual complementary, characterized by the plane E_1^* , derived from E_1 by optional means for folding, being perpendicular to E_2 ;
 P_1 and P_3 being arranged along a second optical path S_2 such that the plane E_3 is spanned by V_1 and the optical axis of S_2 in P_1 , and a plane E_4 is spanned by V_3 and the optical axis of S_2 in P_3 ;
said polarizing layers P_1 and P_3 being mutual complementary, characterized by the plane E_3^* , derived from E_3 by optional means for folding, being perpendicular to E_4 ;
said two optical paths S_1 and S_2 intersecting in P_1 with equal cutting angles between N_1 and S_1 and between N_1 and S_2 ;
the architecture of the system coupling the transmission at P_1 along S_1 to a reflection at P_2 and the corresponding reflection at P_1 to a transmission at P_3 along S_2 .

11 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) according to claim 10,

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comprising an additional fourth polarizing layer P4, which together with said P2 along a third optical path S3 and together with said P3 along a fourth optical path S4 constitutes an additional cross-polarizer according to claim 10.

12 (Canceled)

13 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31,
all of said Pi being cartesian polarizers, ~~e.g. wire-grid polarizers~~.

14 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31,
all of said Pi being thin-film polarizers of the MacNeille type.

15 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31,
all of said Pi being contained in a body and the optical paths into and out of the ~~cross-polarizing system being made possible by~~ with windows or openings.

16 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31, further comprising
at least two spatial light modulators;
said complex polarizer system being used to feed the spatial light modulators with polarized light.

17 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31, further comprising
at least two spatial light modulators;

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said complex polarizer system being used to superpose the modulated light from the spatial light modulators.

- 18 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31, further comprising at least two spatial light modulators of the type micro-electro-mechanical-system (MEMS, e.g. ~~DMD by Texas Instruments~~);
said complex polarizer system being used to feed the spatial light modulators with polarized light and to superpose the modulated light from the spatial light modulators.
- 19 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) according to claim 9, further comprising at least one spatial light modulator positioned in said optical paths S1 and S2 between P1 and P2.
- 20 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 15, further comprising at least one spatial light modulator which is mounted to the body.
- 21 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being a compound prism composed of two right triangular sub-prisms with the base of an isosceles triangle each, with a thin-film type polarizing layer P1 ~~with its layer vector V1~~ being situated between these two sub-prisms;
the lateral surface of the compound prism which consists of two lateral surfaces of the sub-prisms carrying a cartesian type polarizing layer P2 ~~with its layer vector V2~~;

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V2 being perpendicular to V1.

22 (Currently amended): Complex polarizer system ~~for reciprocal polarization~~
~~{cross-polarizer}~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being a compound prism composed of two right triangular sub-prisms
with the base of an isosceles triangle each, with a cartesian type polarizing
layer P1 ~~with its layer vector V1~~ being situated between these two sub-prisms;
the lateral surface of the compound prism which consists of two lateral surfaces of
the sub-prisms carrying a cartesian type polarizing layer P2 ~~with its layer~~
~~vector V2~~.

23 (Currently amended): Complex polarizer system ~~for reciprocal polarization~~
~~{cross-polarizer}~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being a compound prism composed of two right triangular sub-prisms
T1a, T1b with the base of an isosceles triangle each;
those lateral surfaces of the compound prism ~~[[,]]~~ which consist of only one lateral
surface of the sub-prisms carrying ~~polarization layers~~ P1 and P2.

24 (Currently amended): Complex polarizer system ~~for reciprocal polarization~~
~~{cross-polarizer}~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being composed of two right sub-prisms with the base of an isosceles
triangle each;
a thin-film type polarizing layer P1 being situated between these two sub-prisms.

25 (Canceled)

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26 (Currently amended): Method of using a complex polarizer system according to claim ~~30~~ 31.

27 (Canceled)

28 (Canceled)

29 (Canceled)

30 (Canceled)

31 (New) Complex polarizer system,

comprising an arrangement of three polarizing beam splitting layers P_i , wherein $P_i = P_1, P_2, P_3$;

each P_i being characterized by its layer vector V_i , wherein $V_i = V_1, V_2, V_3$,
whereas V_i is defined to be coplanar to P_i and is defined such that a linearly polarized light beam propagating towards P_i is reflected at P_i if its plane of polarization is equal to the plane spanned by V_i and the propagation axis of said beam;

said polarizing beam splitting layer P_1 being configured to split an unpolarized light beam propagating along axis A_1 into a linearly polarized light beam transmitting P_1 , and a linearly polarized light beam which is reflected by P_1 into the axis A_2 ;

said polarizing beam splitting layer P_2 being arranged along A_1 such that A_1 and V_2 span a plane which is normal to the plane spanned by A_1 and V_1 ;

P_2 and P_1 therefore being configured as a polarizing beam splitting system

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wherein a linearly polarized beam which transmits P1 along A1 is reflected at P2;

said polarizing beam splitting layer P3 being arranged along A2 such that A2 and V3 span a plane which is normal to the plane spanned by A2 and V1; P3 and P1 therefore being configured as a polarizing beam splitting system wherein a linearly polarized beam which is reflected at P1 into A2 transmits P3.

32 (New): Complex polarizer system according to claim 31, comprising at least one right triangular prism; at least one lateral surface of said prism carrying a polarizing beam splitting layer Pi.

33 (New): Complex polarizer system according to claim 32, two lateral surfaces of said prism carrying polarizing beam splitting layers.

34 (New): Complex polarizer system according to claim 8, P1 and P4 being polarizing beam splitting layers of the thin-film type; P2 and P3 being polarizing beam splitting layers of the cartesian type.

35 (New): Complex polarizer system according to claim 31, all of said Pi being wire grid polarizers.

Hopfstadt, April 14th
J. W. J.

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